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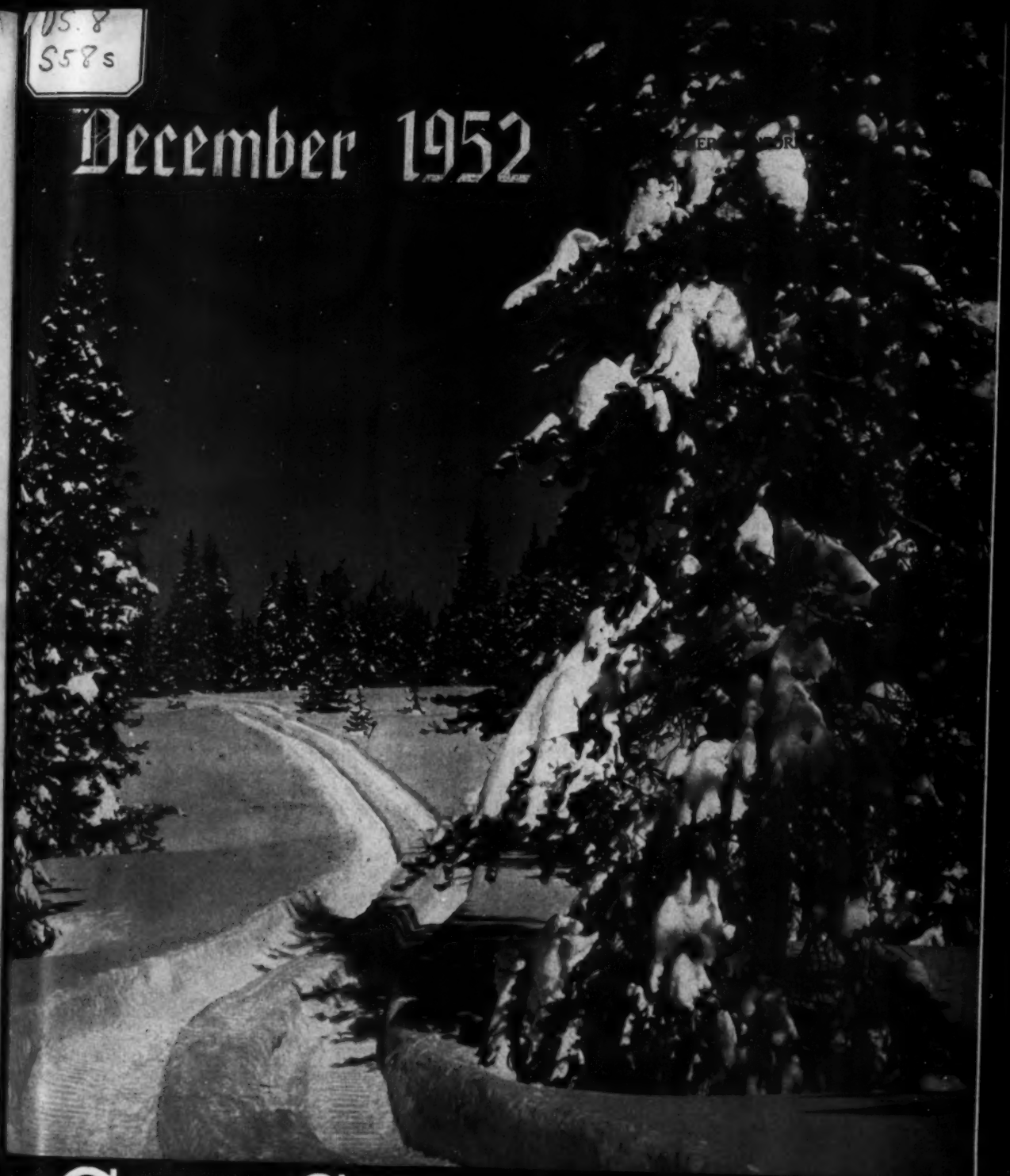

SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION

DECEMBER 1952
VOL. XVIII—NO. 5

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

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ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

★ THIS MONTH ★

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WELLINGTON BRINK
Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, under approval (August 6, 1951) of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

15 CENTS PER COPY — $1.25 PER YEAR

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MORE IRRIGATED LAND FOR NEBRASKA.—Through conservation plans developed by district cooperators and the SCS, 18,400 acres were added to Nebraska's irrigated land during the past fiscal year. In addition, the SCS technicians helped with the revision of existing irrigation systems on over 20,140 acres of other land.

This work required the installation of 1,291 structures to control irrigation water, 458 miles of supply and field ditches, 20 irrigation dams, 150 irrigation wells, and 63 surface pumps, plus the leveling of 15,100 acres of land.

SCS technicians supplied technical-design and lay-out services, farmers and ranchers did the construction work, or hired it done, PMA helped finance the job.

To date, the total number of acres of new land brought under irrigation in Nebraska is over 222,600.

FRONT COVER.—A snow scene which symbolizes nature's season of rest. Where there are conservation practices on the land, much of winter's moisture will be caught and held in the ground when the thawing comes. The runoff will be gradual. Crops will benefit both here and on the farms lower down.

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This scene is on highway near Holly Beach. About 600 head of cattle make the spring trek.

MODERN CATTLE DRIVE

By ROBERT E. WILLIAMS

EVERY cattleman dreams of grass that's green the year around. The dream's a reality for the Richard brothers, Mark and Rudolph, who run about 600 cows on native range in the Gulf Coast Soil Conservation District of southwest Louisiana.

Their secret of year-round green-grass grazing is the use of marsh range half the year and cut-over longleaf-pine range the other half. This system involves a 65-mile overland cattle drive twice a year.

The Richard brothers use the marsh range along the Gulf of Mexico in Cameron Parish from mid-October to mid-April. Then they trail their herd 65 miles north to the cut-over pine range in Calcasieu Parish for grazing from mid-April to mid-October.

Note.—The author is range conservationist, Soil Conservation Service, Crowley, La.

Mark Richard and his brother Rudolph take time out during drive.

Best in the cool season, marsh range grasses start their growth early in the fall and don't get tough until late the following spring. They produce seed from early summer to fall.

The Richard brothers lease their marsh range from H. J. L. Stark, veteran marsh cattleman who has known the Richards so long they speak of him as their "second daddy." They figure on 4 acres of marsh range per cow for the 6 months of grazing. They keep the number of cattle adjusted to the amount of forage on the range. Proper stocking rates, seasonal use of the range, and deferred grazing are part of the conservation program they are carrying out as members of the Gulf Coast Soil Conservation District.

Grasses on the cut-over woodland range begin

Richard herd crosses intracoastal canal on way to cut-over pine range.

their growth in March. They produce seed in the late summer. Their greatest forage value is reached in April and May. After that their value declines.

By taking advantage of the seasonal benefits of the marshland and woodland ranges, the Richards have established a grazing set-up that would be mighty attractive to many western ranchers.

Mark Richard lives in Cameron and takes care of the herd when it is on the winter marsh range. He is a supervisor of the Gulf Coast Soil Conservation District. His brother Rudolph lives at DeQuincy, the summer headquarters. He is in charge of the cattle when they are on the cut-over woodland range.

At the summer ranch 400 acres of cut-over land have been improved by fertilizing the soil, and seeding clovers, Dallisgrass, and lespedeza. The improved pastures are used for springing heifers and cows needing extra attention. Most of the herd gets its forage from the native bluestem range. Eight acres of this type of range are needed to carry a cow for the season.

The Richard brothers round up their cattle each spring and fall for the 65-mile drive. Usually 1 day is required for the round-up, 4 days for the drive, and 1 day to separate the herd for different grazing areas. High light of the drive is the swim across the intracoastal canal.

"We don't truck the cattle, because the drive is easier on them," Mark Richard says. "Loading and unloading cattle is harder on them than the drive. Our calves come from fall till spring and trucking would be too hard on the cows."

Grazing areas have been set up where the cattle spend each night and for a 2-hour midday stop. Two stops are made on open-range areas; the others are made on private pastures of local stockmen. The herd is moved slowly and even small calves make the trip in good shape. No extra feed is used on the drive other than the grazing at the rest stops.

Main sources of forage in the marsh range are marsh hay and gulf cordgrass. Several bulrushes, mainly olney and California, and the common reed are also present.

Resting the fenced marsh range in the summer gives the good forage plants a chance to grow, make seed, and strengthen their root systems. The grasses are kept in such good condition that the Richards give their cattle no extra winter feeding.

Another advantage of moving the cattle to higher ground in summer is that it gets them away from the marshland mosquitoes.

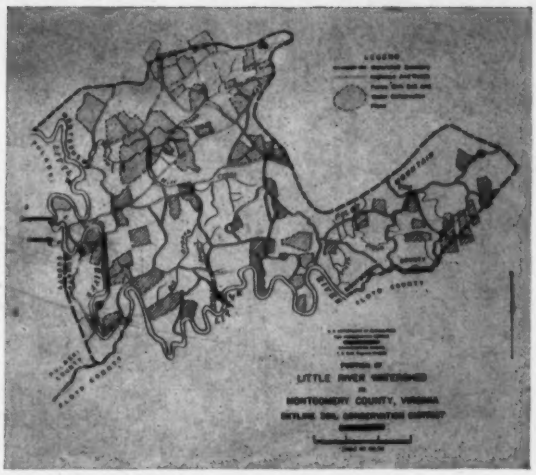
Early spring rest for the woodland range helps the better grasses—the big and pinehill

(Continued on page 112)

This young individualist refused to swim and had to be taken across canal by ferry.

MANY people think of the Izaak Walton League as an organization whose purpose is to provide better fishing for its members. It is true that league members, who call themselves "Ikes," are interested in fishing, even though many of them never fish. Some are fishermen. Some are hunters. Some are outdoor lovers who enjoy camping, hiking, and boating. But all of them are conservationists. They recognize that our Nation's primary resources are its soils, its water, its forests, its minerals, and its wildlife. And the league has appointed itself the defender of these resources.

If a stream is well populated with desirable fish, the Ikes realize that soil is not washing into it, that it is not polluted, and that it is generally a valuable asset to the community,



ONE SMALL WATERSHED AND THE IZAAK WALTON LEAGUE

By HUBERT B. AVERETTE and JAMES L. LITTLETON

the State, and the Nation. On the other hand, if a stream is muddy and devoid of all but coarse fishes, the league members know that something is wrong. It may be polluted by sewage, industrial wastes, or eroded soils. Frequently, such streams are contaminated by all three. To improve conditions, soil erosion must be stopped and other pollution minimized by water-treatment plants.

Little River, which forms the boundary between Montgomery County, Va., on the north and Pulaski and Floyd Counties on the south, is a prime example of a stream polluted by eroded soil. Year after year, the farms in the Little River watershed have become poorer and poorer because their topsoil has washed into the river. In 1946, the Radford Chapter of the Izaak Walton League of America asked the Skyline Soil Conservation District and the State Highway Department to do everything possible to keep soil from washing out of crop fields and off road banks, and silting into Little River. This stream, they felt, could furnish some of the best bass fishing in southwestern Virginia, if it were cleared up and maintained so that fish could have plenty of deep, clear water, good places to spawn, and more food.

About 5 years ago, SCS began working with farmers on the soil-erosion problem. No miracle has been accomplished, but a good start has been made toward cleaning up Little River, and a number of farmers are cooperating with the Skyline Soil Conservation District. The accompanying map shows the number and location of farms cooperating with the district program.

In August 1950, the Christiansburg Chapter of the Izaak Walton League was organized. It adopted a resolution to work with all agencies to help clean up Little River and to encourage the reforesting of areas too steep and too rough to top-dress for pasture.

The following summary outlines the status of the watershed in 1952:

(a) There are approximately 42,000 acres in the Little River watershed.

Note.—The authors are soil conservation aid and soil conservationist, respectively, Soil Conservation Service, Christiansburg, Va.

(b) Approximately 10,000 acres are woodland.
(c) Several thousand more acres that are too steep and rough to lime and fertilize should be planted to trees.
(d) 81 farmers are under soil and water conservation plans.
(e) In these 81 farms are 10,918 acres.
(f) About 900 acres on the cooperating farms have been strip-cropped for crop rotation or pasture.
(g) It is planned to strip an additional 100 acres in the fall of 1952.
(h) 5,912 acres are in permanent pasture.
(i) 1,120 acres are already in, or are being put in, permanent hay as soon as possible.
(j) About 1,720 acres are in woodland.
(k) This summary accounts for 9,752 acres on the 81 farms, which leaves 1,166 acres in idle land, home sites, cropland not suited for strip cropping, and bottom land.

Several farmers in this section are setting out bicolor lespedeza this spring in order to improve the food supply and cover for quail. On most farms there are some strips or patches of land which should be retired from cultivation to conserve soil and water. In many instances, the best treatment of such areas is the planting of vegetation to provide food and cover for wildlife, as well as to prevent the washing of soil and wasting of water. Fifteen thousand bicolor plants and twelve thousand multiflora-rose plants are now established.

Quite a number of these farmers are getting their pastures in good shape and increasing their hay crops. Thus, they are able to cut down on the amount of corn grown and get land that is unsuitable for clean cultivation back into pasture or permanent hay. Some farmers are interested in grassland farming and are working toward that goal. They are killing two birds with one stone. They are improving their farms by holding the soil and water where they will do the most good; and they are building up the fertility of their soil and doing away with most of the erosion problems. By achieving these ends they are automatically doing their part to clear and clean up Little River. It is fairly obvious that cleaning up Little River benefits the farmers in that watershed more than anyone else.

The work already done is only a start. There are many more than 81 farms in the Little River watershed. It is hoped that many of them will soon adopt soil and water conservation practices. Cooperation with the district offers the farm owners a golden opportunity. The State Highway Department has promised to do all in its power to control silting from road banks and drains, now important sources of pollution. The Skyline Soil Conservation District is anxious to assist as many farmers as possible. As Little River is restored to its one-time position as one of the most beautiful streams in Virginia, sportsmen and farmers alike will share the profit and pleasure that result from good soil and water conservation.

DISTRICT PROFILE

ERIC REPPUN
OF
MOLOKAI

Eric Reppun is an outspoken man, and on two subjects he is especially outspoken: communism and soil conservation. He is fully acquainted with both. Eric is not afraid to work against communism, and for soil conservation.

The first cooperator with the Molokai Soil Conservation District, T. H., was Eric Reppun. The first pineapple field laid out for Eric was a problem for both Eric and the engineer assigned to the district. Conditions were new to the latter, and Eric himself was hesitant about some of the fancy curves. The machinery for the laying of paper and subsequent spraying and harvesting is easily handled on straight lines; but on the steep hills with the curves, it takes able operators.

On the first 180 acres Eric went with the engineer almost all the way. He wishes now he hadn't been so hesitant. He remembers that many years ago a huge gully was formed in this field after a torrential kona storm; the field afterward remained idle. The gully was filled and further gullying was prevented, as he and I found out after the first heavy storms. The field amply paid for all the work and produced a record crop of luscious pineapples.

For Eric the jump from pineapples to communism is short. Eric was born in Russia just

before the present regime took over. His father was a very competent physician in the Czar's army. When the Bolsheviks finally caught Dr. Reppun they spared his life because of the shortage of physicians, and because of a typhus epidemic that was raging through the civilians and troops of both sides.

Dr. Reppun had his own hospital in the Ural Mountain town of Tirljian, which is on the border of European Russia and Siberia.

The Bolsheviks took the town, and then the White Russians retook it. During the fighting the Reppun home was destroyed. Fortunately, Mrs. Reppun, Eric, and his brother had left the house and were hiding in the woods when a shell hit it. That night it was decided to escape with the retreating White Army.

Dr. Reppun had assigned to him as wards six husky Czech prisoners. With these six men, four good horses, and two covered wagons, Dr. Reppun and his family struck north away from the armies and diseased and starving areas. This route of 1,000 miles to Omsk in central Siberia was through uninhabited territory used only by hunters and trappers. The way was arduous and the travelers lived by shooting wild game and living off the country. Months of travel finally brought the family to Omsk. The American Red Cross was still operating, and Dr. Reppun was employed.

The Reppuns were still not safe at Omsk. The Communists were 100 miles away, so they fled to Vladivostok. The rail trip of 2,500 miles took 7 months, with train after train being blown up by Communist guerrillas.

Through the Red Cross at Vladivostok, the Reppuns finally gained entrance to the United States at Hawaii. They arrived broke but not broken in spirit. In Honolulu Dr. Reppun settled his family in an old barn and started a medical practice.

The American way of life gave them the opportunity to work, and Eric's father was able to take care of his family. Eric went to Harvard and studied biochemistry. Eric's brother Fred went to Harvard Medical School. Fred is now practicing on Molokai and is a very able surgeon.

From biochemistry to pineapple raising isn't so farfetched. The raising of pineapples is a fine art; the planter must know chemistry and plant processes. Hormones are used to set the fruit, to slow down ripening, and to control many of the plant's life processes. Fertilizers are used by the ton. Iron sulphate is used to supply iron to the plant, which yellows otherwise. The leaves are studied for water content and plant nutrients; the planter must know what to look for.

Unfortunately, the land has not been cared for. Gullies have formed and thousands of tons of soil have rolled off the fields into the sea.

Kona storms on Molokai are eagerly looked forward to. Six inches of rain, followed by six more, then six more, may result. The first six inches are easily coped with, but when the upper soil body fills, watch out! After a heavy kona storm, Molokai is often ringed with a broad band of reddish sea. Then there are long periods when it doesn't rain and the plants die. The wind blows constantly and the soil dries out fast. At great expense water is hauled to the plants.

Eric is doing his best to take care of these factors. By working with the Molokai Soil Conservation District, he has planted his pineapples in the conservation way, and still has maintained an economical level of production. Where his neighbors' fields have straight lines, his are curved to slow down the rush of water. Cut-off ditches and grassed waterways are maintained. Still, there is apt to be erosion after the kona storms.

As the grain farmers have found out, so have the pineapple people; trash mulch works wonders. Trash-mulch machines have been fabri-

cated by the pineapple companies, and many are using them. The 80 or more tons of trash left after the second pineapple crop is no longer buried, burned, or beaten to an oxidized loss. Instead, the mulch is used for the conservation of soil and water. It remains on the surface between the rows to stop the splash of the raindrop and allow the water to soak in slowly. More of the water remains in the soil, where it is protected from the winds and is kept available for the pineapple plant for a much longer time.

Eric is the manager of the Pacific Pineapple Co., a newcomer. Compared with other companies on Molokai, PacPine is small, but its fields yield well. Eric has incurred the gratitude of the Hawaiian Homes Commission, from whom he leases land, for the good management practices he has installed. His company began utilizing trash mulch as soon as the first machines were made. Eric has shown how to take care of the land and at the same time make a profit.

The newest planting for PacPine is in the submarginal rainfall belt, where every drop of rain must be retained. Each new planting entails its own set of problems for Eric Reppun, the soil conservationist, and engineer. Other new areas will open and other new problems will arise. But solutions come in the basic American way—cooperation without coercion.

Eric Reppun has seen communism at first hand and he wants no part of it. He has seen the damage which uncontrolled waters do to the good red earth of Molokai, and he wants no part of that either. Through the knowledge he has gained, and through the work of the Pineapple Research Institute, and through use of the facilities of the Molokai Soil Conservation District, there is basis for believing that the good soil of Molokai will remain in place for those who follow.

—NORMAN K. CARLSON.

WYOMING SECOND IN GAINS.—Although total income from federally owned land in LU projects increased in all the Northern Great Plains Region in 1951, Wyoming's gain was topped only by Kansas. Returns to five Wyoming counties amounted to $19,691.92—88 percent more than the previous year. Mineral lease rents and royalties accounted for much of the increase in Wyoming.

ONE ROOF SERVES ALL

FARMERS are now receiving "one-stop" service from United States Department of Agriculture agencies in more than half the States and counties across the Nation.

This has come about through an effort initiated in 1951 by Secretary Charles F. Brannan to get all USDA agencies in the States and counties housed under a common roof.

The purpose is to achieve greater efficiency and effectiveness in service to farm people and others. The aim is to make it convenient for farmers to get the help they need. Better and quicker results in conservation and increased production are expected from each dollar of appropriated funds through smoother coordination.

The consolidation program applies to all USDA agencies, and the ultimate purpose is to house all Federal agricultural agencies in the same building in each State and county. Initial effort was concentrated on bringing together offices of the Production and Marketing Administration, the Soil Conservation Service, and the Farmers Home Administration in order to coordinate conservation activities as quickly as possible. New Hampshire recently became the first State to achieve 100 percent consolidation at both State and county levels.

As of September 15, State offices of USDA agencies were housed together in 24 States. In an additional 5 States, such housing had been authorized and space was being sought or prepared. In the remaining 19 States current lack of suitable office space or geographical considerations make consolidation impossible now.

On the county level, agency offices have now actually been combined in 1,770 counties, or 59 percent of the more than 3,000 agricultural counties having agency offices. This number can be expected to rise steadily.

Consolidation of office space provides opportunities for cooperative arrangements which improve efficiency and effect economy. Offices housed in the same building can share space,

1. Map indicating before and after locations of Department offices in Claremont, N. H.

2. This foyer and waiting room serves all Louisiana State offices of USDA agencies in new building in Alexandria.

3. This sign in a common conference room indicates arrangement under consolidation in Des Moines, Iowa

4. One mimeographing facility serves all agencies in Richmond, Va.

5. One receptionist does for FHA, PMA, SCS, and FCIC in combined quarters in Syracuse, N Y.

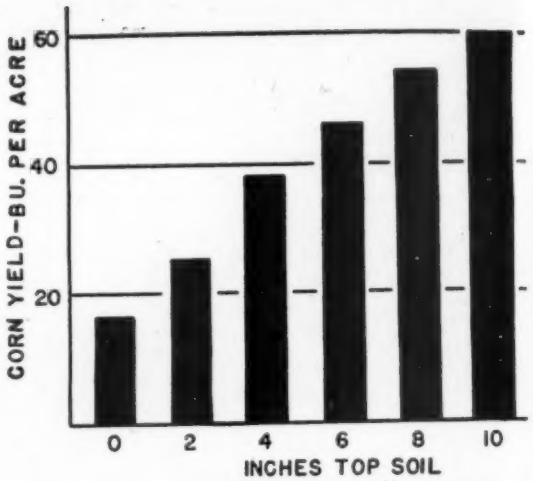
6. It is easy for heads of PMA, FHA, SCS, and FCIC to get together frequently in their building at Richmond.

7. One sign directs farmers to the Sullivan County offices of the Department in Claremont.

8. New York State offices of FHA, PMA, FCIC, and SCS present a united front.

services, and equipment, such as conference rooms, mimeographing facilities, and storage areas. They can also use the same people to answer telephones, receive visitors, take messages, and handle questions.

The common grouping of offices is leading to additional cooperation among agricultural agencies in giving farmers assistance in their efforts to conserve soil and attain greater productivity. The goal to provide farmers with efficient "one-stop" service in every State and county is being pursued aggressively.



Erosion reduces the depth of topsoil and corn yields.

OUR WORK IS BASED ON FACTS

By R. E. UHLAND

I HAVE been asked to tell you about the place research occupies in our soil conservation program. First let us focus our attention on what constitutes a soil conservation program. I think we can agree that the objective must be to conserve and improve the productive capacity of our lands as required for a permanent and balanced agriculture. In working toward this objective the Soil Conservation Service cooperates with the States to provide essential on-the-farm technical assistance to farmers and ranchers through their own local soil conservation districts. Assistance for part of the costs of applying practices is furnished by Production and Marketing Administration and other agencies.

This technical service calls for: (1) the full utilization of the stockpile of agricultural information that has accumulated through research and experience of Land Grant Colleges and the Department of Agriculture over the years; and (2) the continued research and study required to meet the growing needs of changing conditions.

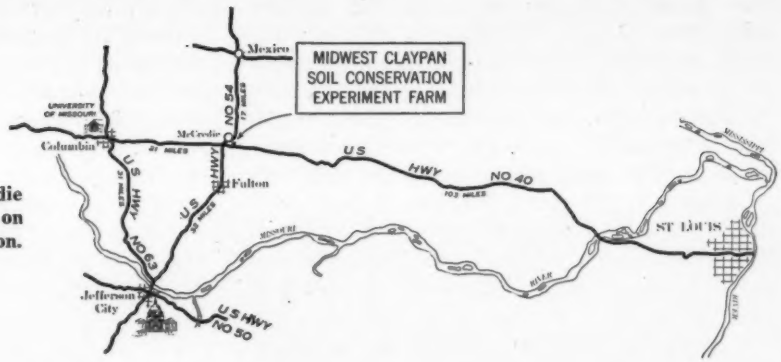
To meet this latter need, experimental farms like this one here in Callaway County, the one at Bethany in Harrison County, and a number of others located in different problem areas in the United States were established. The results obtained from experiments conducted on these farms enable us to determine the relationship between soil management, tillage practices, increase in fertility, crop production, water transmission and absorption by the soil, water runoff, and soil-erosion losses and provides us the opportunity of testing new and improved conservation practices. On the basis of these relationships—which vary widely for different soils and climates—systems of conservation farming are planned which provide for watershed protection and improvement, using the most effective and practical ways of conserving soil and water on lands of different capability classes.

As our conservation program grows, there arises a correspondingly larger number of unsolved problems. This should be met by a concurrent expansion in research facilities rather than by spreading too thinly a restricted research budget.

Our concern in research is to keep our program flexible so as to meet best the needs of our field program. This calls for the termination of studies as soon as the necessary information is obtained in order that our funds and facilities may be directed toward the solution of other pressing problems. We recognize that experiments should not be continued after they have served their purpose, but it is poor economy to discontinue studies before they have supplied their most worth-while information, as has happened on numerous occasions due to the time factor and inadequate funds.

The type of practical applied research which is carried out at this station and other similar stations throughout the country is founded upon

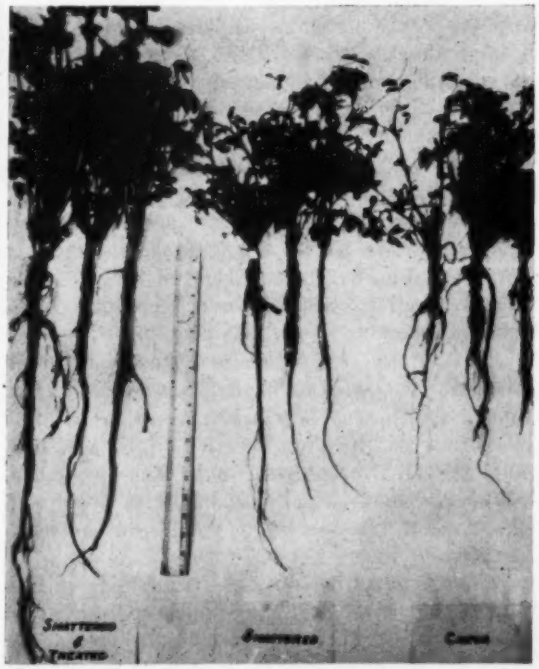
Note.—The author is research specialist, Soil Conservation Service, Washington, D. C. This article is taken from a paper presented at the recent Field Day celebration at the soil conservation experiment farm, McCredie, Mo.



Stations like that at McCredie supply needed information on soil and water conservation.

the basic information accumulated from prior research. When the solution of a given problem appears near from experiments on the station farm, its practical application is developed through field tests carried out on farms in the area where the problem exists.

No nation has too much fertile land. And no nation can afford to lose any of its productive land. Here in Missouri you are fortunate because your farm lands are comparatively young. They have not eroded so severely as lands in some sections of the country. Therefore, much of your good land remains and needs only to be conserved and improved in order to meet the needs of our growing population.



Root zone of claypan soils has been deepened by deep tillage and fertilizing.

The population of our country is steadily increasing. By 1960, the Census Bureau estimates that there will be at least 18 million more people in the United States than in 1950. It is estimated that by 1960 we will need 2.6 billion more pounds of meat, plus 8 billion more quarts of milk, and 583 million dozen eggs per year to feed our increased population. This requires an increase of more than 8 percent in our production of food and fiber over that produced in 1950 if our present standard of living is maintained.

A few years ago I made an analysis of the erosion data from all of the soil and water conservation experimental farms. I calculated the fertility losses under different crop covers and land use. This study indicated that on the basis of land use practiced in 1945–50 and the average long-time soil losses recorded for different crop covers in the different States, plant nutrients having a value *in excess of 17 billion dollars* (on the basis of cost of commercial fertilizers) were lost annually by erosion and through harvested crops from cropland in the United States.

To replace the most common fertilizer nutrients (nitrogen, phosphoric acid, and only one-fourth of the potash that is removed each year by erosion alone) would call for an annual expenditure of approximately *7¾ billion dollars!*

This shows the critical problem ahead of us in the field of conservation and it is certain that ultimate success in maintaining and improving the productivity of our land will depend upon how thoroughly we can prevent erosion losses.

According to reports of the National Ferti-

lizer Association, approximately 849 million dollars were spent for fertilizer in 1950. On the basis of figures published by Parks and Mehring in "Agricultural Chemicals" for October and November 1949, the purchased plant nutrients were about twice the total removed by crops in 1947 after allowing for the nutrients returned in residues and manures. It represents just a little more than 10 percent of the total loss through erosion and harvested crops—excluding the great loss of potash in the Western States.

Farmers have found it necessary and profitable to use larger and larger quantities of fertilizers. This is due in part to their efforts to offset soil-nutrient losses caused by erosion. In 1880 only a few hundred thousand tons of low-analysis mixed fertilizers were used. In 1950, 18⅓ million tons were used. During that interval the plant-food content was raised from about 12 units in 1900 to 22.55 units in 1949. Domestic consumption of fertilizers in the crop year ended June 30 this year topped all prior records, rising 14 percent above 1950–51 to a total of nearly 21 million tons.

During the period 1940–50 the use of fertilizer increased 598 percent in Missouri, 1,144 percent in Illinois, 820 percent in Kansas, and 2,007 percent in Iowa. Notwithstanding this large use of fertilizer, I estimate that a little less than 8 percent of the nitrogen that was lost through erosion and through harvested crops in Missouri in 1950 was returned in fertilizer and manure. About one-fifth of the phosphoric oxide was returned, and only 1 percent of the potash.

Thirty-six-inch sweeps prepare seedbed in volunteer wheat, leaving residue on surface.

With this great current erosion loss it is impractical if not impossible for farmers to replace all nutrients removed from the soil each year by crops and by erosion. In order to maintain or improve soil productivity economically, effective action in reducing erosion losses is imperative. It is impossible either to maintain or improve soils without first stabilizing them. Our major losses of plant nutrients from sloping cropland are through erosion. Also with poor management all soils lose their structure and tilth and yields decline.

Good soil structure and tilth as well as high organic-matter content in the topsoil are always associated with high crop production if necessary nutrients and soil moisture are present. In 1939 and 1940 our cooperative studies with the State agricultural experiment stations of Missouri, Iowa, Indiana, and Ohio showed that at all locations the depth of topsoil had been reduced by erosion. The extent of the reduction of topsoil was governed by the type of management that had been practiced on each field. Soil and water conservation practices were shown to check erosion and bring immediate and continuing increases in corn yields.

The direct relationship between soil depth and yield was noted at all locations. For example, at Fowler, Ind., the average yield of corn in 1940 for those locations in 18 fields that had more than 12 inches of topsoil was 70 bushels per acre. This is in contrast with a yield of only 20 bushels for areas in the same fields that had lost practically all of their topsoil. For areas where the depth of topsoil averaged between 5 and 6 inches, the yield was 47 bushels per acre. The average soil depth for all fields was 8.3 inches, with an average yield of 55 bushels.

At Bethany, the average corn yield for 7 fields in 1940 was 43 bushels and the average topsoil depth was 5.9 inches. For those locations that still had more than 12 inches of topsoil, the yield averaged 68 bushels per acre, while for those areas that had lost nearly all the topsoil the per-acre yield was only 15 bushels.

When I was attending the university in this State the level prairie soils of northeast Missouri—the claypan soils—were frequently referred to as the only large area of land in the State where there was little or no erosion. A

reconnaissance erosion survey made in 1934 under the direction of Dr. L. D. Baver showed, however, that erosion had already claimed a big toll on these soils. These findings, to a large degree, were responsible for the establishment of this experimental farm which you are visiting today.

floods. We must also evaluate the climatic factors as well as the land factors that affect erosion, water yield, and peak rates of runoff.

Our research has shown that the protection offered by vegetation against wind and water is one of the most effective erosion-control tools.

Grass protects the soil against the forces of

Equipment used to measure runoff and erosion from plots in different crops and different cultural treatments.

Our conservation technicians are called upon to plan and design for millions of dollars worth of water-disposal systems and control structures on farms and watersheds. This includes the design for water-control structures such as terraces, waterways, channel controls, drop inlets, and various structures such as dams, reservoirs, ponds, spillways, sediment traps, and control devices for drainage, water conveyance, and application to land in irrigation. Judging from the interest in flood control and conservation, we can expect this type of work to increase. Material savings in construction can be made only if we have more accurate and complete hydrologic information upon which to base our designs.

To furnish the information needed, much research is required. We are particularly interested in the effect of alternate systems of land use on the rate of runoff, water yield, contributions to ground water, and sediment production and transportation. The hydrologic effects of alternate systems of land use must be determined in various sized areas, starting with small plots and carrying through to sufficiently large areas to evaluate their effects on base flow and

wind erosion by reducing the velocity of the wind at the ground surface so that it no longer has sufficient energy to cause soil movement, and the eroding soil is trapped. Its dense sod protects the soil from the force of water erosion by dissipating the force of falling raindrops and reducing the flow of surface water. Grass also plays a major role in the production and maintenance of organic matter and nitrogen and promotes good soil structure and tilth at a low cost.

The organic matter and nitrogen content of most mineral soils is a fairly good index of productivity. Their importance is demonstrated on the Sanborn plots at Columbia, Mo. The effectiveness of grass in reducing erosion and slowing down the rate of microbial oxidation of soil organic matter is indicated by the results on that experimental field.

The amount of nitrogen found in the soil on the different plots varied in direct proportion to the type of cropping that was practiced. I have made a further study of the data on these plots taking into account the erosion losses which were undoubtedly responsible for much of the loss of organic matter and nitrogen.

On the basis of erosion data on the old erosion

Grass has major role in beef production. Bromegrass and Ladino clover made 493 pounds per acre in 1952.

plots at Columbia, it is obvious that subsoil has been mixed with topsoil on the plots cropped annually to corn every time the land was plowed for at least 30 of the 50 years of experimentation. The recovery of nitrogen on the corn plot that received 6 tons of manure annually was reported as 52 percent, compared to a nitrogen recovery of 73 percent for a 4-year rotation with the same addition of manure. Had the organic matter contained in the upper subsoil (which runs about two-thirds of that in the plow depth) been taken into account, the nitrogen recovery would have been much lower for the corn plot than the 52 percent reported.

Before we can hope to maintain or increase the soil organic matter, we must check erosion, which is a selective process. This is shown by the fact that the organic-matter content of eroded soil material may run as much as 10 times as high as the soil from which it erodes. Thus if erosion takes away or wastes from one-half to three-fourths of the manure or fertilizer we apply, we cannot hope to get our money's worth from them.

In order to furnish added protection against erosion when growing tilled crops, research has pioneered in developing cultural techniques for utilizing crop residues as surface mulches. These organic residues are left on the soil surface when preparing seedbeds, by using sweep-type machines for tilling the land instead of ordinary plowing.

We cannot solve our problems by any simple prescription. The part that research must play in our soil and water conservation program is to find out how to grow cultivated crops in the amounts needed without excessive erosion. We know that for maximum protection, mulch or residue farming must be supported by fertilizing, contouring, row drainage, and the interception of excess water by terraces and other measures.

It is necessary that we go further, however, in our developments in these studies. Leaving crop residues on the soil surface introduces many challenging problems which vary widely

This corn picker leaves the stalks as an effective cover against erosion.

for different areas. This system of farming may call for some radical changes in weed and insect control and use of fertilizer, especially with respect to nitrogen.

The research findings at this Claypan station show the way these soils respond to conservation farming practices. Corn grown in a 4-year rotation with 2 years of meadow and with other supporting conservation practices has yielded an average of 109 bushels per acre over a 4-year period. This is in contrast to an average yield of only 18 bushels of corn on adjacent plots cropped to corn and oats without soil-conditioning crops or other conservation treatments. First-year corn in a corn-corn-oats-meadow rotation has averaged 108 bushels compared with 76 bushels from second-year corn. Both had equally high fertilizer treatments.

The urgency for sound knowledge and education in conservation and agriculture in the United States is better appreciated when we take into account that a small percent of our population is doing all the farming.

The records show that in colonial times about 85 percent of our population was busy producing food and fiber for themselves and the other 15 percent. It happens that at the present time this situation is exactly reversed. Now 15 per-

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Standley cattle graze on fescue.

Hugh Standley, and fescue.

MATHEMATICS OF A MANAGED PASTURE

By TOM J. DAVIS

HUGH Standley saved more than $4,000 on cattle feed by properly establishing and managing 32 acres of tall fescue grass.

Using the facilities of the Okfuskee (Okla.) Soil Conservation District, Standley is applying a coordinated conservation program to his farm southwest of Okemah. As part of the program, he planted 300 pounds of tall fescue and 8 pounds of Ladino clover seed on 32 acres of fertile North Canadian River bottom land. That was in the fall of 1950. Ordinarily the recommended planting rate is 10 to 15 pounds of fescue and 1 to 2 pounds of Ladino seed per acre. He prepared the seedbed well.

Sixty rainless days followed, and most of the fescue didn't come up until the following spring. Standley withheld grazing that spring to produce a seed crop and assure fast growth of the fescue in the fall.

In October 1951, Standley turned 127 2-year-old heifers and steers into the 32 acres and kept them there until April. They were not allowed to graze the pasture around the clock. They were put in about 1 o'clock each afternoon and taken out around 4 or 5. They were kept out altogether when the pasture was wet or icy.

This sort of management let the cattle get a good fill of high-protein forage without walking around enough to damage the growth. The fescue was never eaten below 3 or 4 inches in height. That's the secret of good growth.

Standley believes that if he had allowed the cattle to stay on the pasture 24 hours a day, they would have damaged the fescue and clover beyond recovery.

When not on the fescue, the animals were kept in an adjoining pasture and fed 15 bales of Johnsongrass-lespedeza hay a day. The fescue pasture saved 15 bales of hay daily. Not a pound of cake or other supplement was fed as the fescue pasture supplied enough protein.

Standley says that without the fescue he would have had to feed 2 pounds of cake per head daily. By having and properly managing the winter pasture he saved 82½ tons of hay valued at $2,475 and 21 tons of cake valued at $1,932. This was a total saving of $4,407 during the 1951–52 winter.

Cost of seeding the pasture was $225 for the fescue seed, $13.20 for the clover seed, and $230 for 10 tons of rock phosphate, less $120 PMA payment, or $110. This made his total cost, exclusive of seedbed preparation, $348.20. The net saving credited to the fescue therefore amounted to $4,058.80.

Standley took the cattle off fescue April 1, 1952, to get another seed crop. Otherwise,

Note.—The author is soil conservationist, Soil Conservation Service, Holdenville, Okla.

grazing could have continued 2 months longer. He harvested 5,000 pounds of clean fescue seed in June.

"I plan to plant 100 additional acres of fescue to help balance my year-round grazing scheme," Standley says. "Hereafter I'm going to use 100 pounds of ammonium nitrate per acre as top dressing each spring and fall, as this gives a good supply of nitrogen for plant growth and seed production.

"When I can save better than $4,000 on a feed bill while wintering my cattle in good condition, harvest 5,000 pounds of seed and still have my pasture, fescue has a definite place in my conservation program."

MODERN CATTLE DRIVE

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bluestems. As a result there is a larger volume of forage available when the cattle arrive for their summer stay on the cut-over woodland range.

Since cut-over range loses much of its grazing value in the late fall and winter, supplemental pastures or extra feed must be furnished when cattle are kept in the area throughout the year. The Richard brothers have found the marsh range the solution of their winter grazing problem.

WORK BASED ON FACTS

(Continued from page 110)

cent of our population produces the food and fiber required for themselves and the other 85 percent. This obviously places a great responsibility upon our farmers who produce and also upon our research and other agricultural specialists who are called upon for technical information and assistance.

With the active support and assistance of soil conservation district supervisors and farmers, and the cooperation of the State agricultural experiment stations and colleges, the conservation program will continue to move forward and help to establish a more permanent and profitable type of agriculture.

LU LANDS BRING GOOD RETURNS IN NEBRASKA.—In Nebraska the Title III lands are leased to the Sugarloaf and Pine Ridge Soil Conservation Districts. Returns to Dawes and Sioux Counties from the federally owned land in the Land Utilization project last year were $4,016.80, or about 2½ percent more than the preceding year. Dawes County's share was $1,762.97, while Sioux County received $2,253.83.

Mrs. Katie Dearing

By VIRGIL S. BECK

A DEFINITE GOAL

MRS. Katie Dearing is a most unusual person. Although well in her fifties, she manages a cold-storage food locker in Willcox, Ariz., for 7½ hours a day, cutting and wrapping the meat herself. After her work there is finished, she drives to her 160-acre farm, or small ranch, 8 miles from town, where she does all the work single-handed.

A native of Kansas, Mrs. Dearing and her husband moved here from Weatherford, Okla., in 1926. For several years they rented land and farmed on a small scale. In 1940 they rented the 160 acres which Mrs. Dearing now operates. When they bought it in 1944, the place was in native grasses, so they started buying and running a few cattle.

The Dearings were getting along fairly well until Dearing died in December 1947. Mrs. Dearing had to decide between selling the farm and going back to Kansas, or of staying and trying to handle the farm alone. She long had had a vision of what she wanted to make of her land, so she chose the hard way—to stay with her land. But she couldn't make a living from the farm by herself, so she went into Willcox and got a job with a dairy. Then she started buying young calves which she could fatten on her grassland at a profit.

Note.—The author is in charge of current information, Soil Conservation Service, Albuquerque, N. Mex.

She watched her neighbors improve the livestock carrying capacity of their land by irrigating and seeding permanent pastures. She believed she, too, could benefit from a pasture-improvement program, but she would have to go slow because of her limited finances. The widow managed to have an irrigation well drilled in the summer of 1948, but it was not until May 1949 that she was able to buy a pump and have it installed.

She believed that the carrying capacity of her native range grasses—sacaton and tobosa—could be greatly improved by irrigating, so she hired a man to build some irrigation borders for about 20 acres.

"He made such a mess of the borders that I decided it would be better to do the work myself. I bought a small tractor and started doing the farm work after I had finished at the dairy," Mrs. Dearing recalls. "I tried to build an irrigation ditch to take water to the borders, but it didn't work. I didn't have the proper training in this type of work.

"By this time I had learned about the Willcox Soil Conservation District and the help of SCS technicians that could be obtained through the district, so I applied for assistance."

Mrs. Dearing signed a cooperative agreement in August 1951, and Walter Diehl, SCS representative, helped her plan a soil and water conservation program.

She had left the dairy in March 1951, and had started managing the Zero Cottage cold-storage locker plant. There are 120 lockers in the plant, and a lot of hard work is entailed. However, before and after her 7½ hours at the plant, she has managed to get a good start on her conservation program, doing all the farm work herself.

In September 1951, she seeded a couple acres of permanent irrigated pasture near her modest home. On the recommendation of SCS, she used a mixture of perennial rye, tall meadow fescue, Hardinggrass, birdsfoot trefoil, timothy, and lovegrasses, and got a good stand. Last April, she applied 100 pounds of ammonium nitrate to the pasture and it has made excellent growth. The pasture was grazed a little this spring and will be cut for hay to feed next winter.

Around 65 acres of the sacaton and tobosa pastures now have been bordered and irrigated. These native pastures, fenced for rotation grazing, are improving rapidly and are providing good grazing for the livestock. Mrs. Dearing also has seeded some lovegrasses in the pastures. These are doing well, and she plans to keep adding other grasses. Around 80 acres still are in native grasses that cannot be irrigated at present.

Mrs. Dearing has 17 head of beef cattle, including 3 of the mixed Holstein-Herefords that she bought as calves. As she sells off the mixed breeds, she is replacing them with purebred registered Herefords. She has 5 head now and plans to increase her herd as the carrying capacity of the pastures is improved.

Near her home, Mrs. Dearing has established an orchard of about 30 trees, including peaches, apples, plums, and pears; she also has some grapes. In addition, she has a farmstead windbreak coming on, mainly Arizona cypress, which she started herself.

The pastures now support the herd with the exception of a little cottonseed cake and salt that are bought for winter feeding.

"It's a lot of hard work," Katie admits, "but eventually I want to have a small cattle ranch that will support me. I want to get all of the 160 acres leveled and in permanent irrigated pastures and alfalfa that can be cut for winter feed. I also want a herd of purebred Herefords in proportion to the feed I can produce. Too, I would like to build an irrigation reservoir and stock it, because I enjoy fishing."

THE FUTURE OF OUR NATURAL RESOURCES.—The May 1952 issue of *The Annals*, published by the American Academy of Political and Social Science, is devoted to "The Future of Our Natural Resources." Its contents are included under six groupings: The Setting of Conservation, Mineral and Energy Resources, Forests, Soils, Water Resources, and General. All the articles are by leading authorities in the special fields covered. Among these authorities are Stephen Raushenbush, John H. Baker, Alan M. Bateman, Howard A. Meyerhoff, Samuel T. Dana, Hardy L. Shirley, Richard Bradfield, Paul B. Sears, Hugh H. Bennett, and Anthony Wayne Smith.

MONTANA RETURNS.—Returns to 10 Montana counties from federally owned land in the Land Utilization projects in 1951 were $40,654.18, or nearly 17 percent more than the previous year.

Conservation at Rancho de la Sombra

By
VIRGIL S. BECK

MRS. Fred H. Insinger, widowed British war bride of World War I, believes that soil and water conservation practices are just as important on a small ranch as they are on one of hundreds of acres.

She is carrying out a complete conservation program on her 40-acre Rancho de la Sombra, on the Sabino Canyon road about 10 miles northeast of Tucson with only the help of an American-born Chinese, Charley Yee, who was her husband's orderly during World War II.

The late Colonel Insinger, a West Point graduate and veteran of two wars, picked up Yee as his orderly at Fort Winfield Scott in San Francisco in 1942. At that time Yee was stationed with a motor pool and previously had served as houseboy and bartender in California.

Colonel Insinger had taken a liking to Arizona, so when he retired from the Army in 1947, he came here and bought the 40-acre tract and brought his former orderly with him from La Jolla, Calif.

The 40 acres were part of an original homestead of numerous cultivated fields on the site of an old Indian pueblo. Still visible was an animal trail from the nearby Santa Catalina Mountains to an old spring on the tract.

When the Insingers acquired the place only 15 acres had been in cultivation and the rest was in woodlands and building sites. In 1947, a Mexican had farmed about 7 acres, growing watermelons and chili peppers. Part of the land had been irrigated with water brought through a complicated system of pipes and open ditch. The rest could be irrigated only when flood waters were available from Rocky Canyon or from the Tanque Verde Creek.

Mrs. Insinger and companion inspect grasses in irrigated pasture.

The Insingers selected the highest point of their land for the construction of their beautiful home. However, they also wanted to get the little ranch in the best possible shape for growing feed for livestock. The colonel called upon the Pima County Soil Conservation District for assistance and signed a cooperative agreement in November 1947. SCS technicians working with the district helped plan the conservation program.

First, a 115-foot irrigation well was drilled near the headquarters and a 30,000-gallon storage tank was constructed so irrigation could be made by gravity flow. Pipe lines were installed from the tank to the top of each field so irrigation could be done with the minimum loss of water.

Fields were straightened to include all land that could possibly be cultivated and were finish-leveled, with the borders being made narrow enough to make the best use of the small stream of water from the storage reservoir. Head gates were installed in each border. The fields were fenced to facilitate pasturing of the entire ranch or any separate field as desired.

Note.—The author is in charge of current information, Soil Conservation Service, Albuquerque, N. Mex.

An ancient cottonwood, probably dating back to a time when this was the site of an Indian pueblo, overlooks this picturesque fishpond.

Insinger home, built in 1947.

Sixty Rambouillets are kept on the ranch. Most of the lambs are sold.

Baled hay from one of the irrigated pastures.

After the fields had been rearranged there were 20 acres of irrigable land and about 20 acres in desert mesquite that cannot be cultivated because of lack of water. Two irrigated pastures were seeded to a suitable mixture of grasses and legumes. The remainder of the cultivated land is in hay meadows.

Last year 660 bales of hay were cut from 15 acres in six cuttings. This spring, when the livestock could not keep up with the grass growth of the irrigated pastures, 43 bales were cut from 1.2 acres. All feed is consumed by livestock on the ranch.

In 1948, a 2½-acre orchard of prunes, apricots, peaches, almonds, and pecans was planted and is doing well. Papago peas are planted in the orchard and turned under to improve the soil fertility. A windbreak of eucalyptus trees has been established along the rear of the headquarters, and a fishpond has been constructed on a small seep area that could not be cropped.

The Insingers started out with a flock of about 50 Rambouillet ewes and one ram. Mrs. Insinger now maintains a flock of around 60 head and sells most of the lambs. In addition, she has four horses for recreational use.

In April 1950, while on the way to Holland, of which his father had been a native, Colonel Insinger died at sea on the SS Amsterdam.

"When my husband died, I fully expected Charley Yee to leave for he had had no experience with farming until Colonel Insinger brought him here in 1947," the widow says. "However, after having been so closely attached to my husband for about 8 years, I guess he just wanted to stay around and carry on the work."

Anyway, Charley Yee has stuck by Mrs. Insinger and does a very capable job of attending to the farming activities. However, it is Mrs. Insinger who knows all the details about the farming activities.

She can tell exactly what grasses she has in the irrigated pastures, how much acreage is in alfalfa and other crops, what the yields are, how many head of sheep she has, and what is being done to conserve the soil and water on her attractive little ranch.

DISTRICT FARMERS WIN.—The achievements of 11 farmer-applicants were considered in the Washington County division of the 1951 Rural Networks Radio (N. Y.) food-production contest. All of the six first scored as winners were found to be members of the Washington County Soil Conservation District. Two subsequently were disqualified because they were members of the local sponsoring committee. Of the two runners-up who moved into the vacated spots, one also was a district cooperator, giving the district the first five positions. The contest was based on output units per man, with specific units assigned to 65 different production factors. William Jolly, Salem, was first-place winner.

BOTH GEESE AND BEEF BENEFIT

By BOYD CHAMPION

A GOOD land-use program is the best wildlife program, in the opinion of Tibbs Clarke, manager of the Kentucky Woodlands Wildlife Refuge of the United States Fish and Wildlife Service in Trigg County, Ky.

Clarke came to this conclusion as a result of the development of two 35-acre pasture areas on the refuge. These were prepared and seeded with assistance of the Trigg County Soil Conservation District, to provide green pasture for wild geese on the flyway south. Four thousand geese and fifty deer used the pastures all last winter. Furthermore, one of the areas was rented and stocked with 20 steers for summer grazing.

The pastures will serve as demonstration plots for development of other areas in the refuge, and they will promote also an interest in pasture improvement among farmers throughout the soil conservation district.

The program began in July 1951, when the refuge undertook to improve some of its geese range and develop summer pasture. "We weren't too sure what we wanted, so we called in the Trigg County Soil Conservation District," Clarke explained.

As the first step, Dan Amos, SCS soil surveyor assigned to the district, made a land-capability map of the area. As a result of the survey, I recommended a conservation program that would include development of pastures, draining of some excessively wet areas, construction of diversion ditches around certain galled spots, and soil tests to determine lime and fertilizer requirements.

"We began to clear the brush, fill the gullies, and prepare a seedbed in late July," Clarke related. "An SCS technician laid out the diversion ditches and drainage channels and showed us how to build them.

"We are keeping a record of the seed and fertilizer used, the weight of the cattle put on the pasture in the spring, and their weight when taken off in the fall. This will provide us with a demonstration plot for other land in the refuge and will give the soil conservation district some valuable information on the cost of seeding pasture and the probable returns."

When a visiting farmer from Missouri was shown one of the pastures 8 months later, with 20 head of steers grazing the knee-deep growth of grasses and legumes, he was amazed to learn that before improvement the area would have done well to support 2 cows.

"Well, I'm from Missouri, and you've shown me," the visitor commented. "Now tell me how you did it."

As a part of the over-all conservation program for the refuge, the Fish and Wildlife Service has entered into an agreement with the soil conservation district to produce sericea seed on some worn-out land. The district furnished seed and fertilizer for seeding 32 acres this spring and will receive a share of the seed for distribution at cost to farmers in the county.

"I am convinced that a good land-use program is the best wildlife program," Clarke said recently. "We are having capability maps made of all our land, including 55,000 acres in timber and 15,000 acres in farm and brush land.

"We use the woodland primarily as refuge for wildlife. We rent the land that is suitable for pasture and crops to farmers in this area. I am urging the farmers to take advantage of the services offered by the local district."

The district supervisors are equally well pleased with the results. Berlie Futrell, chairman, said:

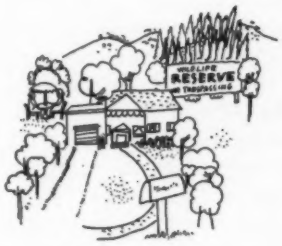
"The people in the county need to use their land more wisely. We believe these fields where accurate costs and gains can be kept will be useful examples of the benefits of sound conservation farming."

So the conservation program developed to provide green pasture for geese on their flyway south will benefit farmers too. It is increasing

Note.—The author is work unit conservationist, Soil Conservation Service, Cadiz, Ky.

the value of poor land and producing beef as a byproduct.

"We think that we have found a good solution in our refuge management by getting the best possible land-use program on these areas," said Larry Givens, of the United States Fish and Wildlife Service. "We can have a better wildlife refuge and increase the income of the people who rent the land from us."



WILDLIFE BEFRIENDED.—Alarmed by the way residential developments are constantly crowding wildlife out of their natural habitat, Mrs. Dirk Brouwer, president of the Riverside (Conn.) Garden Club, has set aside a small acreage of her property as a wildlife sanctuary. The Fairfield County Soil Conservation District helped make a complete conservation plan. The sanctuary became the central theme at the club's conservation exhibit at Riverside school, with the idea of interesting others in like developments. Children joined in making display material. The model of a check dam made by a student won one of the high awards.

BIOLOGY TEACHERS ORGANIZE.—The conservation project launched last year by the National Association of Biology Teachers has received wholehearted support. Over 30 national conservation organizations have endorsed it, and their representatives are serving on the advisory committee.

State committees of biology teachers who will undertake conservation activities in their classes have been or are being organized in all 48 States.

There are two distinct objectives of the project—(1) to encourage biology teachers to engage in some conservation teaching, and (2) to obtain descriptions of outstanding techniques used, for publication in a series of leaflets on conservation teaching.

To help biology teachers understand the type of activities deemed most helpful in teaching conservation, a set of criteria with illustrative examples was prepared in a series of national and State meetings, which have now been published and distributed for use by members of the State committees and others interested in helping with the project. These can be secured from the State and regional chairmen or the project leader.

Each State committee has organized an advisory committee composed of representatives of the State Department of Public Instruction, the State Teachers Association, the State Department of Conservation, and other resource agencies.

The advisory committee in each State is to assist the State chairman and the committee of biology teachers in developing plans for interesting other biology teachers in conservation teaching, using summer workshops and teachers conferences to enroll additional members, and to solicit descriptions of outstanding results with various techniques.

State committee meetings will be held to assist in promotion and development.

The grant-in-aid of $10,000 made by the American Nature Association is being used to underwrite the expenses of State committee work, regional and national meetings to organize the project, and work conferences to review and edit the descriptions and summaries. Several States, including Indiana, North Carolina, and Tennessee, have received additional grants from the National Wildlife Federation.

The following members of the executive committee will be glad to have suggestions of good conservation projects under way and to receive any offers of help: Richard L. Weaver, chairman, P. O. Box 5424, State College Station, Raleigh, N. C.; E. Laurence Palmer, Fernow Hall, Ithaca, N. Y.; Lydia Elzey, 311A Burrowes Building, State College, Pa.; Howard Michaud, 824 N. Main St., West LaFayette, Ind.; Leo Hadsall, Fresno State College, Fresno, Calif.; John Harrold, 110 East Hines St., Midland, Mich., George Jeffers, Longwood College, Farmville, Va.; and Betty Lockwood Wheeler, Mt. Pleasant, Mich.

—RICHARD L. WEAVER.

KANSAS ADDS IRRIGATED LAND.—During the past fiscal year, Kansas added over 12,000 acres of irrigated land, bringing the total to date to nearly 63,400 acres. Land on which irrigation systems have been redesigned and improved is over 76,400 acres.

In accomplishing this, 934 water-control structures have been installed, 1,331 miles of supply and field ditches have been built, 83 irrigation dams have been built, 531 irrigation wells have been developed, 123 surface-water pumps have been installed, and nearly 51,200 acres have been leveled for irrigation.

RETURN FROM FEDERALLY OWNED LAND IN SOUTH DAKOTA.—Eleven counties in South Dakota have federally owned land in the Land Utilization projects. Last year returns from it amounted to $29,942.13, or nearly 17½ percent more than the previous year.

By counties, the returns were Custer, $1,606.55; Fall River, $6,117.14; Jackson, $2,882.07; Pennington, $5,088.24; Jones, $1,335.04; Lyman, $4,022.97; Stanley, $2,399.36; Sully, $825.04; Corson, $1,258.90; Perkins, $4,407.85; and Ziebach, $3.97.

COUNTING CATTLE FROM THE AIR

By J. J. DEUSER

THE light airplane is rapidly becoming one of the real work horses in soil and water conservation in the Northern Great Plains.

It is being used successfully to speed up soil conservation surveys and reduce their cost per acre. It is an effective means of showing people the need for conservation and what can be done about it. It has helped several SCS technicians speed up conservation planning on large ranches. It has been used for seeding grass in difficult range areas where reseeding was necessary.

Now it has been used for making counts of livestock on a Land Utilization project, in the interests of improving range management. Whether or not trespassing livestock was on the range was determined in a short time through the use of a light plane.

Use of such a plane for livestock counts in the summer of 1951 took place in the vicinity of Wall and Interior, in western South Dakota, where the Cane Creek, White River, and Eastern Pennington County grazing districts handle the allotment of grazing privileges on land administered by the Soil Conservation Service. The districts hired plane and pilot. Since the SCS is also interested in uses being made of the Government-owned land, an SCS employee went along to do the counting. Livestock counts by plane were made again this year.

The area is one that had discouraged taking counts on the ground. It ranges from rather sharply rolling to out-and-out badlands. It would require many riders and several days' time—an expensive proposition. Even then, there would be the likelihood of missing some stock in rough country.

Yet, with an airplane to give a top-side view, the counts were finished in a relatively short time. It was possible to see all the pasture and into every draw where livestock might be located.

Note.—The author is soil conservationist, land management, Soil Conservation Service, Lincoln, Nebr.

Take one pasture, for example—the Weta community pasture of 34,920 acres. Some of it is fairly rough, although mostly it is rolling country. The count was made in less than 2 hours. By comparison, it is estimated that at least 10 to 15 riders would have to work one or more days to make such a count in that pasture.

Several things were learned:

First, the count should be made early in the summer—preferably in June. Later in the year, it is more difficult to distinguish spring calves from yearlings from the air.

Second, early morning is the ideal time. Then cattle are spread out and grazing. Later on, after they go to water, they bunch up until late afternoon or evening.

Third, the plane should be able to travel slowly. A helicopter would be best, but is seldom available. Next best is one of the popular light planes. The faster the plane travels, the greater the chance for error.

Fourth, counting from a plane establishes only the total number of livestock in the pastures. If there are too many, the animals must be brand-counted on the ground to determine the owners of the excess stock. If there are no trespassing stock, no further action is needed.

Fifth, besides the savings in time and cash by the use of a plane, there is no loss in weight, as they are not disturbed during the counting.

Sixth, a tally counter is needed to keep track of the number counted. It's easy to forget the number already totaled or become confused while determining which have or have not been counted.

Seventh, stockwater supplies and salt conditions can be determined at the same time.

Livestock counts on range land, whether publicly or privately owned, are desirable because good range management requires that the number being grazed be kept within proper bounds. This is for the purpose of keeping grasses in their most productive condition, protecting the land from erosion, and conserving

the largest amount of moisture. Unless counts are made, there is no way to detect whether strays have come onto the range or whether, in the case of a lease or permit, more stock are on the range than the contract authorizes.

Experience near Interior indicates that the light plane offers a way to get this job done quickly and cheaply. It is anticipated that a similar counting program will be inaugurated in other areas in South Dakota and adjoining States.

KANSAS LEADS.—In the Northern Great Plains Region the past fiscal year, Kansas had the greatest increase in returns from federally owned land in the Land Utilization project with $11,862.10—more than double the returns for the previous year.

Stevens County, with only 840 acres of federally owned land in the project, received $97.27. The rest, $11,764.83, went to Morton County, in which nearly all of the LU project is located.

SCIENCE POINTED WAY.—When technicians working with the New Haven County (Conn.) Soil Conservation District advised Roxanne Beardsley to clear a thick growth of cedars and plant Ladino in a section of her 60-acre farm along the ridge between Southbury and South Britain, she says that "it sounded crazy because the grass there was sparse, wiry, and dried up by July 1, and Ladino needs moisture."

The soil is broken-down traprock, however, the best in Connecticut. Last summer the 9 acres of Ladino, first established there, gave complete daytime pasture for 18 cows from May 9 through October 4. On one-half acre per cow per day, the animals were sated at 11 a.m. and lying down for the rest of the day. On June 1, "when the Ladino was getting ahead of the cows," cuttings from half of the acreage were put in silo.

Again, the technicians advised locating a farm pond in a natural water bowl. Miss Beardsley wanted to move it 50 feet, close to a border fence, but followed the technicians' advice. When the bulldozer got down 4½ feet, after a 40-day drought without any rain, water gushed in so fast that two pumps had to be used to keep the machine from drowning. Her comment: "When SCS technicians say it is so, it must be so. Our farm is nearly twice as productive today as it would have been if we had ignored their advice."

MORE FEED FOR WYOMING LIVESTOCK.—New land for development of irrigation lies both inside and outside of formal irrigation projects. It includes parts of ranches where added feed production was needed and parts of dry-land farms. It includes units already partially irrigated.

During the past fiscal year nearly 8,000 acres were added to Wyoming's irrigated land, bringing the total to 44,190 acres. Land on which irrigation systems have been redesigned and improved is 136,204 acres.

SOIL CONSERVATION DISTRICT NURSERY.—In the face of a heavy work load in the Barnstable (Mass.) Soil Conservation District, supervisors voted to meet the need for planting stock by starting a tree and shrub nursery. The county government cooperated under an agreement to provide a site at the County Farm, where a nursery is now being established. Plantings will be light during the first few years, so the supervisors can profit from their production experiences. Potter County Soil Conservation District in Pennsylvania has a similar project that is 6 years old and is producing 50,000 seedlings annually for district cooperators. In this instance, one of the district directors provided the site.

GRASS DIGGINGS.—"It looked like a community workday for a sick friend on the farm of A. L. Stone, Altha, Route 1, when word got around that he had Coastal Bermuda-grass for sale."

That was the comment of a reporter for the Dothan, Ala., *Eagle*, on attending a "grass diggin" in the Chipola River Soil Conservation District across the State line in Florida.

The remarkable thing about this grass-digging operation was that the farmers, whose fathers before them had fought Bermuda-grass all their lives, actually were digging the grass and hauling it away to plant on their own farms.

As farmers from three counties gathered to take part in the digging, a farm-implement dealer of Marianna, Fla., turned out with a rotary hoe to help out.

Stone planted 8 acres in the grass in July 1948 with foundation stock from the Brooksville Nursery of the Soil Conservation Service, furnished through the soil conservation district. He agreed to make the grass available to other district farmers at the proper time.

This is an example of how the district has helped in the distribution of planting stock of this vigorous tall-growing hybrid which was developed at the Georgia Coastal Plain Experiment Station. The new grass has become extremely popular in the rapidly expanding grassland agriculture of the Southeast.

To make the best possible distribution of planting stock, District Conservationist R. B. Stamey reports, grass diggings have been arranged at various locations within the districts in his work group. As many as three separate diggings have been held in widely separated communities on the same day.

"Holiday" group learns what determines a range site.

"RANCHER'S HOLIDAY".—The cooperators of the Muskogee County Soil Conservation District in northeastern Oklahoma recently held their second annual "Rancher's Holiday."

This year the holiday was spent studying grasses and range sites on the John L. Black ranch near Warner. Black showed the visitors the results of spraying persimmons in a 546-acre native pasture with 2-4-5-T in May and June 1951. Though some trees had leafed out and new sprouts were showing, Black appeared to have an 85-percent kill. He explained that he was trying to control rather than eradicate the brush. He planned to respray the persimmons.

Black emphasized that with proper management, deteriorated range in the hill country of northeastern Oklahoma can be brought back to excellent condition. He pointed to his 100-percent calf crop this year as proof of the value of conservation range management.

Charles A. Evans, area conservationist; Lloyd Gholson, work unit conservationist; Roy Croft, soil scientist; and Neal Stidham, range conservationist of the Soil Conservation Service, showed the visitors how to determine range sites and condition classes, how to identify the important grasses, and discussed the management of native grasses.

R. C. Borum, chairman of the board of supervisors of the Muskogee County Soil Conservation District, announced that "Rancher's Holiday" would be an annual event sponsored by the district.

—MAURICE GAMBLE.

DISTRICT HOST TO ASSOCIATION.—A number of ranches in the Tehachapi Soil Conservation District were inspected by 30 experts on the occasion of the annual meeting of the International Crop Improvement Association at Davis, Calif. The September convention was the first time the organization has met in the United States west of the Mississippi River.

Among those who toured the district were men from Canada, Wales, and 10 States of this country. The following institutions were represented: the Alberta Department of Agriculture, Canada; the Department of Agriculture, Toronto, Canada; the University of Wales; the Bureau of Plant Industry, Soils & Agricultural Engineering, Beltsville, Md.; the Minnesota Experiment Station, St. Paul, Minn.; the University of Maryland, College Park, Md.; the University of Nebraska, Lincoln; the Utah State Agricultural College, Logan, Utah; Cornell University, Ithaca, N. Y.; and the United States Cotton Field Station, Shafter, Calif.

A number of fields devoted to the production of certified seed, such as ranger and Atlantic alfalfa, were visited. Many of the members were interested in seeing Akaroa orchardgrass and Goars tall fescue. Established conservation measures were observed and discussed. These included contour grade plantings, proper water application, and land leveling.

ROY E. BALLARD

IRRIGATED LANDS INCREASE IN MONTANA.—The total land brought under irrigation in Montana to date through conservation plans is 79,330 acres. A little less than a third is land where the needed alterations in existing irrigation systems made it possible to irrigate more land with the available water. The other new irrigated land is where both the water supply and the irrigation system had to be developed. Land on which irrigation systems have been redesigned and improved is nearly 131,600 acres.

Over 11,500 acres of the new irrigated land were added during the past fiscal year.

Five young men from Thailand.

The five young men seen above in a peach orchard near Spartanburg, S. C., are from Bangkok, Thailand, but they are also honorary citizens of the State of North Carolina. While they were studying soil conservation methods near Greensboro, N. C., District Conservationist C. R. Lamb introduced them to Gov. W. Kerr Scott. Governor Scott was so impressed with their manners and bearing that he issued official proclamations making each of the young men an "Honorary Citizen" of North Carolina.

The five honorary citizens of the Tar Heel State are, left to right: Laph Tanthasri, Suthep Tingsabhat, Parkit Onvimala, Boonyong Sirivathana, and Apichai Lamchiagdhase.

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